

Quantifying uncertainties in the Atmospheric Modelling (ATM) simulations resulting from different emission time resolution

The International Monitoring System (IMS) developed by the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) is a global system of monitoring stations, using four complementary technologies: seismic, hydroacoustic, infrasound and radionuclide. The radionuclide network comprises 80 stations, of which more than 60 are certified. These radionuclide stations provide global monitoring of radioactive aerosols and radioactive noble gases supported by atmospheric transport modelling (ATM) to allow detected radioactivity to be attributed to a source. Recent studies suggest that the ATM performance using different emission time resolutions is not significantly different. The availability of emission data for IRE (Belgium) and ANSTO (Australia) for the full year of 2014 gave an opportunity to verify the aforementioned statement for different atmospheric conditions. For the purpose of this study, the simulated activity concentrations of Xe-133, calculated using four different emission time resolutions (daily, half-daily, 3 hours and 1 hour), were compared with the available measurements collected by the IMS noble gas stations influenced by these facilities.

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